

Track Preference: Lessons Learned

Presentation Title: Lessons Learned for Planning and Estimating Operations Support Requirements

Synopsis:

This presentation will explore the results of a recent D&NF Program Office study of the drivers behind operations development and execution cost growth and will identify areas of emphasis that can be used to improve early project and project replan cost estimates.

Abstract:

Operations (phase E) costs are typically small compared to the spacecraft development and test costs. This, combined with the long lead time for realizing operations costs, can lead projects to focus on hardware development schedules and costs, de-emphasizing estimation of operations support requirements during proposal, early design, and replan cost exercises. The Discovery and New Frontiers (D&NF) programs comprise small, cost-capped missions supporting scientific exploration of the solar system. Even moderate yearly underestimates of the operations costs can present significant LCC impacts for deep space missions with long operational durations, and any LCC growth can directly impact the programs' ability to fund new missions. The D&NF Program Office at Marshall Space Flight Center recently studied cost overruns for 7 D&NF missions related to phase C/D development of operational capabilities and phase E mission operations. The goal was to identify the underlying causes for the overruns and develop practical mitigations to assist the D&NF projects in identifying potential operations risks and controlling the associated impacts to operations development and execution costs. The study found that the drivers behind these overruns include overly optimistic assumptions regarding the savings resulting from the use of heritage technology, late development of operations requirements, inadequate planning for sustaining engineering and the special requirements of long duration missions (e.g., knowledge retention and hardware/software refresh), and delayed completion of ground system development work. This presentation summarizes the study and the results, providing a set of lessons NASA can use to improve early estimation and validation of operations costs.